

### REMARKS

The careful examination given this application, and the allowance of claims 1-22 and 41-44, as well as the indication of allowability of claims 27-29, are appreciated.

#### Claim Objections

The Examiner requested that reference in the dependent claims to "apparatus" be changed, and this is now done with all dependent claims under claims 1 and 23.

The wording in claim objection 3 is changed as suggested by the Examiner.

Regarding objection 4, the attorney points out that the change requested by the Examiner should not be made. Although many people would word the phrase as requested by the Examiner, this is known as a "split infinitive" and is to be avoided whenever possible under the rules of grammar. The infinity words "to cool" should stay together under proper grammar, not being split by adverbs such as "efficiently". Thus, although the phrase ". . . so as efficiently to cool the anode . . ." might sound unusual to some, this is actually the more preferred and correct grammar. No reference is being submitted in support of this "split infinity" rule, as it is well established, but a reference will be provided if requested by the Examiner.

The change requested in objection 5 has been made.

The attorney apologizes for the misnumbering relative to claim 18A. At this stage, to avoid confusion and errors, claim 18A has been renumbered as claim 45.

Regarding objection 7, again in relation to claim 18A (now claim 45), the material in the last four lines of the claim state an efficient use that can be made of the construction recited. The words "such that" are now changed to "whereby". To make the changes suggested by the Examiner would actually change the meaning of the claim. The point of the flexible outer wall is that it will not sustain a vacuum in its normal state, but it will collapse or shrink in diameter under a vacuum. Since the wording indicates an intended use and an advantage, it is believed now properly recited, especially with the word "whereby" substituted for the original wording (although the original wording indicated the same use and advantage).

Regarding objection 8, this related to an error, and the words "toward the coolant delivery head" have now been deleted.

For objection 9, note that claim 41, lines 4-5, recited a "liquid coolant"; this has now been revised to read "coolant liquid".

Objection 10 has been remedied as suggested by the Examiner.

### § 103 Rejections

Claim 23 and its dependent claims, with the exception of claims 27-29, were rejected over Parker RE34,421 in view of Chornenky published application US2004/0218724. Forman Patent No. 6,390,967 was applied in combination with these two references with respect to certain dependent claims.

The rejection of claim 23 is respectfully traversed.

The Examiner has helpfully included drawing figures from the Parker and Chornenky patents. Although the Examiner is correct in describing what is shown in those drawings, neither reference discloses or suggests what is described in claim 23. The last paragraph of claim 23 describes two lumens in the catheter that are generally coaxial and concentric. The outer lumen serves as an inflow channel for coolant liquid and the inner lumen serves as an outflow channel. The x-ray tube is defined as being positioned centrally and generally coaxial with respect to the inner lumen. An embodiment of this is illustrated in Figure 3 of the current application. The claim goes on to state that the lumens and the x-ray tube are positioned to effect the flow of coolant from the inflow lumen (outer lumen) over the anode end of the x-ray tube to return in the proximal direction through the outflow lumen (inner lumen).

Taking first Parker, Parker does show a cooling chamber 96. Apparently liquid flows in via one of the tubes 98, 100 and flows

out through the other, thus flowing over the exterior of the x-ray tube shown at 90. As acknowledged by the Examiner, these inflow and outflow lumens are not coaxial or concentric and there is no outer lumen and inner lumen as claimed.

Chornenky adds little or nothing to the teaching of Parker. The coolant circulation flow pattern in Chornenky is better seen in Figures 2 and 3. The inflow and outflow ports 36 and 38 shown in Figure 1 do not meet the structural description of the lumens in claim 23. Figures 2 and 3, and the text of Chornenky at paragraphs 19 and 20, reveal that coolant entering from the input port 36 "then flows through channel 37 in catheter sheath 34, [see very small channel 37 in Figures 2 and 3, formed in the catheter sheath], around x-ray emitter assembly 20, through channel 39 [the diametrically opposite small channel shown in Figures 2 and 3] and is retrieved at the output port 38. This flow of coolant around emitter 10 serves to cool the emitter during operation."

Thus, neither reference describes or even remotely suggests inner and outer generally concentric and coaxial lumens, with coolant liquid flowing distally through the outer lumen, turning about and flowing back in the reverse direction through the inner lumen, and in such flow cooling the anode end of the x-ray emitter.

For these reasons, it is submitted that all of claims 23-40 and 45 clearly define over the prior art and should be allowed along with the remaining claims.

Favorable action is solicited. A telephone call would be appreciated if any issue remains.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Th. M. Freiburger", written in a cursive style.

Date: November 14, 2005

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